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INFORMATION DISCLOSURE STATEMENT BY APPLICANT U.S. Department of Commerce Patent and Trademark Office

Attorney Docket No.: NICHIA-00700

Serial No.:09/463643

Applicant: Shuji Nakamura, et al.

Filing Date: January 25, 2000

Group Art Unit:

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Date Considered:

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a Sheet 2 of 11 MM Serial No.:09/463643 U.S. Department of Commerce Attorney Docket No.: NICHIA-00700 **FORM PTO-1449** Patent and Trademark Office (Modified) Applicant: Shuji Nakamura, et al. -INFORMATION DISCHOSTRE STATEMENT BY APPLICANT Group Art Unit: 28/5 Filing Date: January 25, 2000 (37 CFR § 1.98(b)) 2/16/83 Weyrich, et al. 357 17 BH 7/23/85 4531142 384 12/3/84 530 BI 2/4/86 **Imazaike** 4568206 357 7/19/84 17 BJ Krimmel 6/24/86 4596998 427 9/12/84 BK 74 7/8/86 4599244 Falckenberg, et al. 427 9/11/84 BL 74 4599245 -7/8/86 Falckenberg, et al. 357 3/1/83 BM 17 4604637 8/5/86 Ruhle, et al. BN 156 2/27/85 4615766 662 10/7/86 Jackson, et al. 12/23/85 BO 372 50 4656636 4/7/87 Amann, et al. 6/6/85 148 BP 171 4/28/87 4661175 Kuphal, et al. 156 4/21/86 BQ 649 6/2/87 4670093 Maerz, et al. 372 9/13/85 BR 44 4682337 7/21/87 Amann BS 372 9/12/85 Heinen 44 . 4683574 7/28/87 9/6/85 372 BT Wolf 44 4722088 1/26/88 9/15/86 156 234 BU 4740259 4/26/88 Heinen 9/6/85 372 44 BV 5/3/88 Heinen, et al. 4742525 372 3/13/87 50 BW 4744088 5/10/88 Heinen, et al. 350 3/13/85 BX 320 Auracher, et al. 4746195 5/24/88 9/23/86 BY 350 96.20 Heywang 4763979 8/16/88 372 9/5/86 36 BZ 4768199 8/30/88 Heinen, et al. 350 4/1/87 96.12 CA Amann, et al. 12/20/88 4792200 1/30/87 372 CB 46 12/20/88 Mueller, et al. 4792959 437 5/26/87 CC 129 4818722 4/4/89 Heinen 250 483.1 10/1/87 CD 4829188 Shinomiya, et al. 5/9/89 357 2/3/88 30 CE Plihal 4835575 5/30/89 357 17 12/7/87 CF Heinen 6/20/89 4841344 372 2/22/88 38 CG 4845723 7/4/89 Heinen, et al. 423 4/12/88 301 CH Ichinose, et al. 4855118 8/8/89 3/2/88 313 487 CI Minematu, et al. 4859903 8/22/89 7/5/88 357 17 CJ Snyder, et al. 4864369 9/5/89 9/29/88 350 96.12 CK 9/26/89 Schimpe 4869568 313 6/28/88 487 $C\Gamma$ Ichinomiya, et al. 12/26/89 4890033 8/25/88 437 129 CM 4904617 Muschke 2/27/90 8/22/88 437 150 Neumark 4904618 2/27/90 7/14/89 357 17 CO Schellhorn, et al. 3/6/90 4907044 12/9/88 118 725 Huang, et al. 3/13/90 4907534 1/26/88 118 719 4911102 3/27/90 Manabe, et al. Mon Common ! Date Considered: Examiner:

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Sheet 3 of 11 FORM PTO-1449 (Modified) INFORMATION DESCRESURE STATEMENT BY APPLICANT

U.S. Department of Commerce Patent and Trademark Office

Attorney Docket No.: NICHIA-00700

Serial No.:09/463643

Applicant: Shuji Nakamura, et al.

Filing Date: January 25, 2000

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	CÜ	4945394	7/31/90	Palmour, et al.	357	34	10/26/87
	CV	4946547	8/7/90	Palmour, et al.	156	643	10/13/89
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	DL	5019746	5/28/91	Merg	313	512	12/4/89
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	DU	5065207	11/12/91	Heinen	357	30	2/5/91
	DV	5077145	12/31/91	Shinomiya, et al.	428	691	12/21/90
	DW	5093576	3/3/92	Edmond, et al.	250	370.01	3/15/91
	DX	5119540	6/9/92	Kong, et al.	29	25.01	7/24/90
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	DZ	5122845	6/16/92	Manabe, et al.	357	17	2/26/90
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Attomey Docket No.: NICHIA-00700

Serial No.:09/463643

Applicant: Shuji Nakamura, et al.

Filing Date: January 25, 2000

Group Art Unit:

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	EL	5210051	5/11/93	Carter, Jr.	437	107	6/5/91
	EM	5218216	6/8/93	Manabe, et al.	257	103	12/20/91
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SWB	FK	5343316	8/30/94	Morimoto, et al.	359	50	6/29/93

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* * * . MAY 2 2 2000 Sheet 5 of 11 Attorney Docket No.: NICHIA-00700 Serial No.:09/463643 U.S. Department of Commerce FORM PTO-1449 Patent and Trademark Office (Modified) Applicant: Shuji Nakamura, et al. INFORMATION DISCLOSURE STATEMENT BY APPLICANT Group Art Unit: 28/5 Filing Date: January 25, 2000 (37 CFR § 1.98(b)) 8/14/92 126 437 Huang 9/6/94 FL 5344791 6WB 8/5/92 102 345 Hunter 10/25/94 FM 5359345 11/22/93 372 22 Yang, et al. 11/8/94 FN 5363390 5/5/93 23 430 Yoneda, et al. 11/22/94 FO 5366834 10/30/92 257 99 Tamaki, et al. 11/29/94 FP 5369289 1/10/94 252 301.4 R Royce, et al. FQ 12/27/94 5376303 3/19/93 437 127 Kish, et al. FR 12/27/94 5376580 10/13/92 324 753 Edmond, et al. 1/10/95 FS 5381103 9/27/93 257 410 Stein FT 1/17/95 5382822 4/16/93 437 133 Takeuchi, et al. 2/14/95 FU 5389571 11/22/93 92 372 Fouquet, et al. 2/14/95 FV 5390210 12/13/93 77 257 Edmond, et al. FW 2/28/95 5393993 2/18/94 257 461 Brown, et al. 2/28/95 FX 5394005 11/6/92 437 129 Shieh, et al. 4/4/95 FY 5403774 8/19/94 362 249 Klinke, et al. 4/4/95 FZ 5404282 1/22/93 257 431 Manabe, et al. GA 4/18/95 5408120 4/22/94 187 437 4/25/95 Glass, et al. GB 5409859 6/23/93 76 257 Edmond, et al. GC 5/16/95 5416342 9/20/93 301.4 R 252 Tatciwa, et al. 5/23/95 GD 5417886 4/6/94 117 102 Nakamura 7/18/95 GE 5433169 12/20/93 384 488 Imazaike 7/18/95 GF 5433533 9/20/93 301.4 R 252 Okada, et al. 7/18/95 GG 5433888 3/10/94 252 301.4 S Bando, et al. 7/25/95 GH 5435938 5/3/94 250 330 Ebitani, et al. 8/1/95 GI 5438198 6/5/92 238 437 Palmour 10/17/95 GJ 5459107 11/26/91 365 149 Cooper, Jr. et al. GK 11/7/95 5465249 12/5/91 578 364 11/14/95 Fan, et al. GL 5467291 1/12/94 107 437 Nakamura, et al. 11/21/95 GM 5468678 10/27/93 99 257 Harrah, et al. 12/12/95 GN 5475241 6/15/94 257 183 Moli 3/5/96 GO 5497012 10/12/95 94 257 Kish, et al. 3/26/96 GP 5502316 11/24/92 77 257 Palmour 4/9/96 GQ 5506421 20 1/17/95 372 GR 4/23/96 Amann 5511084 1/24/94 209 437 Lowery, et al. 5/7/96 GS 5514627 3/23/95 301.4 P 252 6/4/96 Okada, et al. 5523018 9/20/94 77 257 BUR Edmond, et al. 6/4/96 GÜ 5523589 Date Considered: Down Examiner:

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT Serial No.:09/463643 Attorney Docket No.: NICHIA-00700 U.S. Department of Commerce **FORM PTO-1449** Patent and Trademark Office (Modified) Applicant: Shuji Nakamura, et al. Group Art Unit: 38/ Filing Date: January 25, 2000 (37 CFR § 1.98(b)) 257 77 8/9/93 Edmond, et al. GV 7/23/96 5539217 4/28/94 257 13 Nakamura, et al. GW 5563422 10/8/96 11/17/93 257 96 Nakamura, et al. GX 11/26/96 5578839 4/19/95 372 45 GY 12/10/96 Yamazaki, et al. 5583879 2/3/95 257 77 Tischler G2 12/17/96 5585648 4/19/95 257 94 HA Koide, et al. 5587593 12/24/96 372 9/20/94 45 HB Edmond, et al. 1/7/97 5592501 11/1/95 385 31 Ruh HC 1/7/97 5592578 6/8/95 372 96 HD 1/21/97 5596595 Tan, et al. 8/12/94 437 22 HE 2/18/97 Edmond, et al. 5604135 45 4/19/95 372 HF 2/18/97 Kato, et al. 5604763 437 12/9/94 238 HG Palmour 3/18/97 5612260 9/25/95 257 102 HH 3/25/97 5614736 Neumann, et al. 2/22/95 117 102 HI 4/1/97 Yamada 5616177 438 6/26/95 507 HЈ 4/15/97 Manabe, et al. 5620557 9/6/95 372 69 Bancy HK 5621749 4/15/97 6/8/95 94 257 Chai HL 4/29/97 5625202 526 4/26/95 92 MH 5/6/97 Sato 5627244 12/9/94 257 77 Palmour HN 5/13/97 5629531 438 10/7/94 33 HO Negley 5/20/97 5631190 11/30/95 423 65 HP 6/3/97 Singh, et al. 5635146 97 10/26/95 372 King, et al. 6/24/97 HQ 5642375 257 88 8/31/95 HR Sassa, et al. 7/22/97 5650641 6/17/96 257 13 Nakamura, et al. HS 7/29/97 5652434 257 7/19/95 94 HT Sassa, et al. 7/29/97 5652438 3/8/95 257 190 HU 5656832 8/12/97 Ohba, et al. 5/23/95 372 96 HV Wang, et al. 5659568 8/19/97 438 5/24/95 32 HW Tischler 8/26/97 5661074 9/20/96 257 190 HX Kish, Jr., et al. 8/26/97 5661316 5/22/96 372 46 HY Huang, et al. 8/26/97 5661742 257 96 3/29/95 Schetzina HZ 9/23/97 5670798 11/30/94 106 117 IA 10/21/97 Dmitriev, et al. 5679153 359 11/21/96 346 King, et al. IB 11/4/97 5684623 9/16/94 77 257 Allen IC 11/11/97 5686737

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Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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Patent and Trademark Of
INFORMATION DESCRIPTION STATEMENT BY APPLICANT Serial No.:09/463643 Attorney Docket No.: NICHIA-00700 U.S. Department of Commerce **FORM PTO-1449** Patent and Trademark Office (Modified) Applicant: Shuji Nakamura, et al. Group Art Unit: 29/5 Filing Date: January 25, 2000 (37 CFR § 1.98(b)) 117 84 2/5/96 IF 2/17/98 5718760 Carter, et al. 6/6/96 77 257 IG 2/17/98 Singh, et al. 5719409 9/21/94 345 102 IH Hunter 3/3/98 5724062 372 11/15/96 II 20 Chang 5724373 3/3/98 11/30/95 372 IJ 96 5724376 3/3/98 Kish, Jr., et al. IK 372 96 10/31/95 3/10/98 5727014 Wang, et al. 257 13 9/6/96 IL Rudaz 5729029 3/17/98 99 4/25/96 372 IM 5729567 3/17/98 Nakagawa 437 11/9/95 IN 5733796 127 3/31/98 Manabe, et al. 6/10/96 257 IO 5734182 96 3/31/98 Nakamura, et al. 10/24/95 257 89 IP 4/14/98 Kimura, et al. 5739552 5/8/95 257 103 IQ 4/14/98 Edmond, et al. 5739554 5/15/97 216 65 Shih IR 5741431 4/21/98 437 12/27/96 128 IS 5741724 4/21/98 Ramdani, et al. 9/9/96 315 291 IT 5742133 4/21/98 Wilhelm, et al. 257 6/10/96 103 IU 5747832 Nakamura, et al. 5/5/98 257 3/7/97 94 IV 5753939 5/19/98 Sassa, et al. 6/27/97 IW 362 259 Haitz 6/2/98 5758951 1/25/96 372 31 IX Baldwin, et al. 5761229 6/2/98 257 749 6/17/96 IY 6/16/98 5767581 Nakamura, et al. 6/3/96 372 31 IZ 5771254 6/23/98 Baldwin, et al. 438 11/19/96 767 JA 7/7/98 Palmour 5776837 11/30/95 257 96 JB 7/7/98 5777350 Nakamura, et al. 7/11/96 313 512 JC 7/7/98 Lester, et al. 5777433 216 3/22/96 24 JD 5779924 7/14/98 Krames, et al. 427 554 12/18/96 JE . 5780120 7/14/98 Belouet, et al. 362 6/29/95 32 JF Wiese 5785404 7/28/98 6/13/96 257 18 JG 8/11/98 Nido 5793054 257 10/24/97 98 JH 8/11/98 Kish, Jr., et al. 5793062 372 45 7/30/96 JI Yang, et al. 5805624 9/8/98 257 3/29/96 88 JJ 9/15/98 Spaeth, et al. 5808323 345 83 4/21/95 JK 5808592 9/15/98 Mizutani, et al. 1/25/96 372 43 JL Baldwin, et al. 5809050 9/15/98 438 3/26/96 46 JM Koike, et al. 5811319 9/22/98 Mueller-Mach, et al. 3/4/96 313 512 JN 5811931 9/22/98 BWB 6/10/96 Van De Ven. 345 83 JO 5812105 9/22/98 . m Bans Date Considered: Examiner:

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Sheet 8 of 11 PTO-1449

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INFORMATION DISCLOSHES ATEMENT BY APPLICANT Attorney Docket No.: NICHIA-00700 Serial No.:09/463643 U.S. Department of Commerce **FORM PTO-1449** Patent and Trademark Office (Modified) Applicant: Shuji Nakamura, et al. Group Art Unit: Filing Date: January 25, 2000 (37 CFR § 1.98(b)) 9/30/96 372 36 9/22/98 Spaeth JP 5812570 9 W 1/6/97 257 433 JQ 5814870 9/29/98 Spaeth 372 46 7/19/96 JR 10/6/98 Tan, et al. 5818861 372 12/29/95 45 JS 10/27/98 Van De Walle 5828684 257 9/29/97 77 JT Singh, et al. 11/3/98 5831288 1/25/96 Yuen, et al. 372 36 JU 5835514 11/10/98 372 11/19/96 97 JV 11/10/98 5835522 King, et al. 438 5/23/97 47 JW 11/17/98 Kish, Jr., et al. 5837561 372 11/19/96 45 JX 11/17/98 Edmond, et al. 5838706 372 12/27/96 45 JY Ramdani, et al. 5838707 11/17/98 8/1/95 372 50 Lin, et al. JZ 11/17/98 5838708 437 2/7/96 21 Akasaki, et al. KA 12/8/98 5846844 7/14/97 512 313 KB 5847507 12/8/98 Butterworth, et al. 372 3/18/96 43 KC 12/15/98 Kuramata 5850410 425 12/27/95 116 KD Lumbard 1/5/99 5855924 252 12/23/92 301.4 F KE Chau, et al. 5858277 1/12/99 5/10/96 313 485 KF Murazaki, et al. 1/12/99 5859496 427 3/25/96 248.1 KĢ 1/19/99 Greene, et al. 5861190 6/26/97 313 495 KH Kondo, et al. 1/19/99 5861713 372 5/27/97 45 KI Sassa, et al. 5862167 1/19/99 372 3/12/96 45 KJ Corzine, et al. 5867516 2/2/99 1/13/98 117 952 KK 2/9/99 Disalvo, et al. 5868837 12/19/97 257 749 KL 3/2/99 Nakamura, et al. 5877558 9/24/97 252 301.45 KM Yale 3/9/99 5879587 9/24/97 252 301.45 Yalc KN 3/9/99 5879588 257 8/30/96 96 KQ 5880486 3/9/99 Nakamura, et al. 3/27/97 372 31 Walker KP 3/30/99 5889802 8/8/97 372 45 Nagai, et al. KQ 3/30/99 5889806 372 43 10/27/94 Tan, et al. KR 4/6/99 5892784 372 4/22/96 96 KS Tan, et al. 4/6/99 5892787 7/2/97 257 94 Nitta KT 5/4/99 5900650 11/6/97 257 103 KU 5905276 5/18/99 Manabe, et al. 5/27/97 250 214.1 5/25/99 Gramann, et al. 5907151 5/20/97 257 95 KW 6/15/99 Negley 5912477 257 98 12/21/95 Haitz, et al. KX 6/29/99 5917202 WBKY 422 7/26/96 Yamanaka, et al. 121 7/6/99 5919422 Date Considered: Examiner: **EXAMINER:**

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INFORMATION DISCLOSISSEMENT BY APPLICANT U.S. Department of Commerce Serial No.: 09/463,643 FORM PTO-1449 Attorney Docket No.: NICHIA-00700 Patent and Trademark Office (Modified) ? Applicant: Shuji Nakamura et al. (Use Several Sheets If Necessary) Group Art Unit: Filing Date: January 25, 2000 (37 CFR § 1.98(b)) FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS Translation Document Subclass Country / Patent Office Class Publication Date Number ·No Ycs BWB X HOIS 3/18 JP 5/18/92 04144294 AA X HOIL 21/20 JP 7/11/97 09180998 AB X HOIS 3/18 JP 9/19/97 AC 09246651 X JP H01S 3/18 10/3/97 AD 09260772 X H01S 3/18 JP 11/11/97 09293935 AE X 3/18 H01S JP 9/11/98 AF 10242565 X 3/18 JP HOIS 9/25/98 10256645 AG X 3/18 HOIS JP 10/9/98 AH 10270792 X 33/00 JP H01L 10/27/98 10290027 ΑI X JP HOIS 3/18 11/4/98 10294529 **AM** X 3/18 HOIS JP 12/4/98 10321962 AN X HOIS 3/18 JP AN 11040893 2/12/99 MO TRANS. HOIS 3/30 2000-31599 1/28/00 'AO' TRANSLATION DE 196 48 33/00. DE HOIL 5/28/97 955A1 AQ OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication) "InGaN/GaN/AIGaN-based laser diodes with modulation-doped strained-layer superlattices grown on an epitaxially laterally overgrown GaN substrate," Shuji Nakamura et al., Applied Physics Letter, Vol. 72, No. 2, January 12, 1998. AR AS AT AU AV AW AX AY AZ BA /BB Date Considered:

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